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Daily MCQs: 03-05-2024

1. Consider the following statements

- 1) Unlike the Appiko movement, Chipko movement is a historic citizen movement aimed at conserving biodiversity.
- 2) Sunderlal Bahuguna, an Indian eco-activist and one of the leaders of the Chipko movement was a Gandhian.

Which of the statements given above is/are correct?

- A) 1 only
- B) 2 only
- C) Both 1 and 2
- D) Neither 1 nor 2

2. Consider the following statements with respect to 'Hydroponics'

1. It is a method of soilless farming in which plants are grown using mineral nutrient solutions in the liquid medium.
2. Hydroponics helps plants to grow faster with higher yield when compared with conventional soil based cultivation.

Which of the statements given above is/are correct?

- A. 1 only
- B. 2 only
- C. Both 1 and 2
- D. Neither 1 nor 2

3. The primary purpose of geoengineering techniques is to

- A) Exploit natural resources for economic development
- B) Reverse the process of desertification
- C) Mitigate the effects of climate change, such as global warming
- D) Enhance agricultural productivity in all regions

4. Which of the following principles are adhered to by regenerative agriculture?

- 1) Minimize soil distribution through conservation tillage
- 2) Diversify crops to replenish nutrients
- 3) Retain soil cover using cover crops

Select the correct answer using the codes given below

- A) 1 only
- B) 1 and 2 only
- C) 2 and 3 only
- D) 1,2 and 3

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5. Consider the following statements

- 1) Green hydrogen is produced by electrolysis of water using renewable energy and has a lower carbon footprint.
- 2) Blue hydrogen is produced from natural gas where the associated emissions are released to the air.
- 3) Turquoise hydrogen is made using a process called methane pyrolysis to produce hydrogen and solid carbon.

How many of the above statements are correct?

- A) Only one
- B) Only two
- C) Only three
- D) None

Solutions:

1. Answer: B

Explanation

- **Appiko movement and Chipko movement are both historic Citizen Movements to Conserve Biodiversity.** Hence **statement 1 is incorrect.**

Chipko Movement

- It is a **social-ecological movement** that practiced the Gandhian methods of satyagraha and nonviolent resistance, through the act of hugging trees to protect them from falling.
- The modern Chipko movement started in the early 1970s in the **Garhwal Himalayas of Uttarakhand**, with growing awareness towards rapid deforestation.
- Sunderlal Bahuguna is an Indian eco-activist and Gandhian peace worker who has been one of the leaders of the Chipko movement. Hence **statement 2 is correct.**
- The landmark event in this struggle took place on March 26, 1974, when a group of peasant women in Reni village, Hemwalghati, in Chamoli district, Uttarakhand, India, acted to prevent the cutting of trees and reclaim their traditional forest rights that were threatened by the contractor system of the state Forest Department.
- Their actions inspired hundreds of such actions at the grassroots level throughout the region.
- By the 1980s the movement had spread throughout India and led to formulation of people-sensitive forest policies, which put a stop to the open felling of trees in regions as far reaching as Vindhyas and the Western Ghats.
- The first recorded event of Chipko however, took place in village Khejarli, Jodhpur district, in 1730 AD, when 363 Bishnois, led by Amrita Devi sacrificed their lives while protecting green Khejri trees, considered sacred by the community, by **hugging them.**

Appiko Movement

- The Appiko movement was a **revolutionary movement based on environmental conservation in India.**

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- The Chipko movement in Uttarakhand in the Himalayas inspired the villagers of the district of Karnataka province in southern India to launch a similar movement to save their forests.
- In September 1983, men, women and children of Salkani 'hugged the trees' in Kalase forest. (The local term for 'hugging' in Kannada is appiko.)
- The Appiko movement gave birth to a new awareness all over southern India.

Why in the news?

- The Chipko Movement which took place in the 1970s marked its 50th Anniversary.

2. Answer: C

Explanation

- **Statement 1 is correct:** Hydroponics is a subset of hydroculture, which is a method of growing plants without soil (Soilless farming) by instead using mineral nutrient solutions in a liquid medium. Terrestrial plants may be grown with only their roots exposed to the nutritious liquid, or the roots may be physically supported by an inert medium such as perlite or gravel.

Advantages of Hydroponics

- The increased control over growing conditions makes it easier to provide the best possible environment for plants, leading to better quality produce and high yield.
- **Statement 2 is correct:** Plants grow 50% faster than soil based cultivation under the same condition because of the easy access to food and water. The production in hydroponics may be increased approximately two times as compared with soil cultivation in a comparable area with correct management practiced because the plant does not have to compete for moisture and nutrients.
- Hydroponics gardens can provide plants with optimum qualities of the necessary nutrients during the different seasons. This will enable maximize growth to be achieved
- A small hydroponics garden can be set up almost anywhere, even upstairs, balconies and open areas and protected structures because the land is not necessary.
- Hydroponics products generally taste better and are higher in nutritional value than field-grown crops.
- The occurrence of soil borne disease and nematode damage is not possible, so hydroponic production is exported safely
- There is no need for crop rotations as growing media can be reused continuously or replaced.
- The plants are uniform in growth and maturity.

3. Answer: C

Explanation

- Geoengineering is a deliberate, **large-scale intervention** carried out in the Earth's natural systems **to reverse the impacts of climate change**, according to the Oxford Geoengineering Programme. This involves techniques to physically manipulate the global climate to cool the planet.

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- These techniques fall primarily under three categories:
 - **Solar radiation management (SRM)**
 - **Carbon dioxide removal (CDR) and**
 - **Weather modification.**
- Specific technologies include
 - **Solar geoengineering** or ‘dimming the sun’ by spraying sulfates into the air to reflect sunlight back into space;
 - **Ocean fertilization** or the dumping of iron or urea to stimulate phytoplankton growth to absorb more carbon;
 - **Cloud brightening** or spraying saltwater to make clouds more reflective and more.

4. Answer: D

Explanation

- **Regenerative agriculture** is a system of farming principles and practices that seeks to **rehabilitate farm ecosystems** by placing a heavy premium on soil health, biodiversity improvement, water and air quality.
- It includes practices like use of natural inputs, minimum-till, mulching, multicropping and sowing of diverse and native varieties.

Principles in Regenerative Agriculture

- Regenerative agriculture adheres to the following principles:
 - **Minimize soil disturbance through conservation tillage**
 - **Diversify crops to replenish nutrients**
 - **Retain soil cover using cover crops. Hence all the statements are correct.**
 - Integrate livestock, which adds manure to the soil and serves as a source of carbon sinks.

Significance

- Regenerative farming can reduce emissions from agriculture and convert croplands and pastures into carbon sinks.
- It improves **crop yield** and promotes the growth of nutrient rich crops.
- It facilitates **soil aggregation and nutrient cycling.**
- Other benefits of regenerative agriculture include more efficient water use and fewer pests.

Why in the news?

- States like Odisha have been promoting regenerative agricultural practices to promote food security and enhance resilience to climate change.

5. Answer: B

Explanation

- Hydrogen can be ‘grey’, ‘brown’, ‘Turquoise’, ‘blue’ and green.
 - **Statement 1 is correct:** Green hydrogen is produced through **electrolysis using renewable sources of energy** such as solar, wind or hydel power. It is produced by splitting water into hydrogen and oxygen using renewable electricity. That makes

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green hydrogen the **cleanest option** – hydrogen from renewable energy sources **without CO2 as a by-product**.

- The vast majority of industrial hydrogen is currently produced from natural gas through a conventional process known as **steam methane reforming (SMR)**. The standard SMR process produces what is known as **Grey Hydrogen** and has the **major disadvantage of releasing large quantities of by-product CO2** into the atmosphere - the main culprit for climate change.
- Grey hydrogen has increasingly been produced also from **coal**, with significantly higher CO2 emissions per unit of hydrogen produced so much that it is often called **brown or black hydrogen** instead of grey.
- **Statement 2 is incorrect: Blue hydrogen**, too, is produced using electricity generated by burning **methane or coal** but with **technologies to prevent the carbon released** in the process from entering the atmosphere;
- **Statement 3 is correct: Turquoise hydrogen** is made using a process called **methane pyrolysis** to produce hydrogen and **solid carbon**. As a result, there is no requirement for carbon capture and storage (CCS) and the carbon can even be used in other applications. Where the electricity driving the pyrolysis is renewable, the process is **zero-carbon**.

